

**I. REMARKS**

The Second Office Action in this application (hereinafter “Second Office Action”), dated January 9, 2007, and any references cited therein have been carefully reviewed; this paper is intended to be fully responsive to the Second Office Action. Claims 1-11 presently stand rejected. After entering this response, claims 1-11 still remain pending. Reconsideration and reexamination of this application in view of the following remarks is herein respectfully requested.

**A. APPLICANTS’ ANSWER TO EXAMINER’S RESPONSE TO ARGUMENTS**

Applicants have reviewed the Examiner’s comments with regards to the rejection of claims 1-11 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,254,503 to Chiba et al. (“Chiba”) in view of U.S. Patent No. 6,106,689 to Matsuyama (“Matsuyama”), Office Action, dated September 7, 2006, at 2, item No. 3, and acknowledge the Examiner’s withdrawal of the rejection. Second Office Action, at 3, item No. 4.

**B. CLAIM REJECTIONS - 35 U.S.C. § 103**

All pending claims stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiba in view of Japanese Patent No. JP2002-178151 to Kagami et al. (“Kagami”).

In rejecting claims 1-11 under 103, the Examiner states, in relevant part, that “Chiba et al. discloses a pulley for a CVT comprising first and second pulley halves (2/4) having truncated movable portions symmetrically opposite to each other (col. 3, lines 46-50) and are movable relative to each other on a rotational axis. Each pulley half has a sloping surface (3/5) with a maximum height roughness average  $R_y$  of 0.6-2.5 micrometer and the centerline average roughness of 0.1 to 0.5”, but notes that “Chiba et al. fail to disclose the average roughness ( $R_a$ ,  $y$ ) measured in a direction ( $y$ ) circumferential to the x-axis”, as required by all of Applicants’ rejected claims. Second Office Action, at 2, item No. 3. Furthermore, the Examiner finds that “Kagami et al. discloses a disk circumferential surface having an average roughness in the circumferential direction of about 0.7-10.00  $\mu\text{m}$  (which is within the range of the claimed invention).” Id. Based solely upon this observation, the Examiner concludes that “it would have been obvious to one of ordinary skill in the art to modify the roughness of Chiba et al. so that the average roughness of ( $R_a$ ,  $y$ ) of the maximum height ( $R_y$ ) is 0.02 to 0.6 micrometer in view of Kagami et al. in order to avoid large and uneven irregularities.” Id. at 3.

A proper rejection under 35 U.S.C. § 103(a) requires that the Examiner establish *prima facie* obviousness. See MPEP 2142 (“The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.” Emphasis in original.) Three basic criteria must be met to establish a *prima facie* case of obviousness:

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

If the Examiner fails to meet his or her burden of establishing a *prima facie* case under 103(a), Applicants are under no obligation to submit evidence of nonobviousness. See MPEP § 2142.

Applicants respectfully submit that the Examiner has not established *prima facie* obviousness with respect to claims 1-11 for at least two reasons: first, the rejected claims recite elements and limitations that are neither taught nor suggested by the references cited and, thus, the third criterion necessary to establish *prima facie* obviousness has not been satisfied. Secondly, the Examiner has not provided a proper motivation or suggestion to combine the references cited and, thus, the first criterion necessary to establish *prima facie* obviousness has not been satisfied. These arguments will be set forth in detail below.

1. The Cited References, Individually or when Combined, Fail to Teach or Suggest all of the Elements and Limitations of the Rejected Claims.

To properly establish *prima facie* obviousness, each and every limitation recited in the rejected claim must be taught or suggested by the prior art cited by the examiner. See MPEP § 2143.03. See also, In re Royka, 490 F.2d 981 (CCPA 1974). Additionally, if a base claim is nonobvious because each and every limitation recited therein is not taught or suggested by the prior art, “then any claim depending therefrom must also be deemed nonobvious.” See MPEP § 2143.03, citing In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). Applicants submit that both Chiba and Kagami, whether considered individually or collectively, fail to teach or suggest each and every limitation set forth in the rejected claims.

Base claims 1, 5, and 9 similarly recite:

A pulley engageable with a belt for use in a continuously variable transmission (CVT), comprising: first and second pulley halves ... including truncated conical portions symmetrically opposed to each other and outer surfaces being axially opposed to each other ... said outer surfaces having ... a circumferential roughness average (Ra,y) measured in a direction (y) circumferential to the axis”.

Due to the conical geometry of the first and second pulley halves 14, 16, Applicants’ claimed circumferential roughness average (Ra,y), as explicitly defined in paragraphs [0016]-[0018] of the specification, is measured by mapping the surface texture in a 3-dimensional plane along the pulleys circumference (preferably conducted with a non-contact optical profiler.) In this regard, Applicants’ claimed circumferential roughness average (Ra,y), as illustrated in Figure 2 and described in paragraph [0016], is not measured in the traditional, linear fashion – e.g., along a straight line with a traditional contact stylus.

In contrast, both Chiba and Kagami unequivocally state that their “centerline average roughness Ra” and “arithmetic mean granularity Ra”, respectively, are defined as prescribed in the Japanese Industrial Standard (JIS) B0601-1994. Chiba, at Col. 4, lines 8-34; Kagami, at ¶15. JIS B0601-1994 is an industrial standard based on 2-Dimensional stylus roughness measurement method taken in a straight line along a flat surface (i.e., a contact method.) According to JIS B0601-1994, the arithmetic mean roughness Ra is the arithmetic average of the maximum height Ry - maximum peak to lowest valley vertical linear distance within a single sample length of a surface irregularity measured perpendicular from a predetermined reference point/line - taken along a flat, predetermined length of specimen, and is expressed as an absolute value of deviation from the mean line. In direct contrast to the rejected claims, Kagami’s arithmetic mean granularity Ra can be taken using “a sensing-pin type relative roughness meter (5 micrometers of needle points)”, taken “on a slot front face as the average of the measured value of the circumferential direction in the location of four 90 degree spacing of peripheries.” Kagami, at ¶15 (emphasis added.) As would be readily apparent to one having ordinary skill in the art, Kagami’s arithmetic mean granularity Ra is calculated by taking the average of four sets of linear measurements, each set taken along four flat sections of Kagami’s feeding roller 1, spaced 90 degrees apart about the periphery, using a stylus contact-type measuring device.

In light of the above remarks, Applicants submit that the § 103(a) rejection of base claims 1, 5 and 9, under Chiba in view of Kagami, is improper and should be withdrawn. In addition,

because claims 2-4, 6-8 and 10-11 ultimately depend from claims 1, 5 and 9, respectively, they are each allowable for at least those reasons that the base claims from which they respectively depend are allowable. Accordingly, withdrawal of the § 103(a) rejection of claims 2-4, 6-8, and 10-11 based upon Chiba in view of Kagami is also respectfully requested.

2. The Examiner Fails to Provide a Proper Motivation or Suggestion to Modify the Pulley for a CVT of Chiba according to the Welding Wire Feeding Roller of Kagami

An Examiner may combine the teachings of multiple prior art references to produce the claimed invention and establish § 103 (a) obviousness only where there is a teaching, suggestion, or motivation to do so, found in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See § 2143.01(I). Even if the proposed combination of references teaches each and every element of the claimed invention, a rejection based on a *prima facie* obviousness is improper without a motivation to make the combination. See Id. See also, In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998). “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” MPEP § 2143.01(III), (emphasis in original). See also, In re Mills, 916 F.2d 680 (Fed. Cir. 1990). Applicants respectfully submit that the Examiner may not properly combine Chiba with Kagami to make the outstanding 103(a) rejection as there is no motivation or suggestion to make the combination, and further because Kagami is not proper 103(a) “analogous art”.

The Examiner has not identified where in the prior art references an explicit motivation to combine is found. Rather, as motivation to combine the maximum height Ry recited in Chiba with the mean granularity Ra recited in Kagami, the Examiner states that “it is well known in the art that the average roughness in the circumferential direction is inherently included in a circular disk”, and therefore “it would have been obvious to one of ordinary skill in the art to modify the roughness Chiba et al. so that the average roughness of (Ra, y) of the maximum height (Ry) is 0.02 to 0.6 micrometer in view of Kagami et al. in order to avoid large and uneven irregularities.” Second Office Action, at 2-3, item No. 3 (emphasis added.) Applicants respectfully submit that the Examiner, in addition to not identifying an explicit motivation or

suggestion to make the proposed combination, has also failed to show how the proposed combination is implicit in the prior art.

“The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” MPEP 2143.01, citing In re Kotzab, 217 F.3d 1365, 1370 (Fed. Cir. 2000). Notably, the rejected claims do not recite “a circular disk” as identified by the Examiner, but instead recite “first and second pulley halves ... including truncated conical portions”. Accordingly, the Examiner has, at a minimum, failed to properly show where in the knowledge of one of ordinary skill in the art the proposed combination would be implicitly found. In addition, Applicants submit that the Kagami reference is insufficient “analogous art” for the Examiner to rely upon and combine with the Chiba reference in making the § 103(a) obviousness rejection noted *infra*. See e.g., MPEP §2141.01(a) (In conducting an obviousness analysis of the subject matter at issue, the Examiner must first determine if the references are “analogous prior art”.) “In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” *Id.*, citing In re Oetiker, 977 F.2d 1443, 1446, (Fed. Cir. 1992).

First, the Kagami reference is outside the pertinent field of endeavor. The Applicants’ field of endeavor is that of power transmissions for vehicles and industrial equipment, namely the design of continuously variable transmissions (“CVT”) of the pulley/sheave type. On the contrary, the Kagami reference relates to the field of “full automatic [rollers] and wire feeding used for semiautomatic welding”. Clearly, the art of welding-wire-feeders cannot be said to be a part of the same field of endeavor as the design of CVT transmissions for motorized vehicles.

Second, Kagami is not directed at solving a problem that is reasonably pertinent to the particular problem to which Applicants’ are concerned. More specifically, Kagami relates to the design of a “wire-for-welding feeding roller” that is “capable of displaying an excellent feeding property ... to supply a weld zone at [a predetermined] fixed rate” in order to “perform stable welding.” The present invention is directed towards the optimization of surface roughness friction properties of a CVT pulley to boost torque-carrying capacity, improve transmission durability and wear resistance, and minimize belt slippage. There would be no motivation for

one of ordinary skill in the art of CVT pulley design to look to the teachings of Kagami in order to improve the surface friction properties of a CVT transmission pulley.

In light of the above remarks, Applicants respectfully submit that Examiner's § 103(a) rejection of claims 1-11 based upon the proposed combination of Chiba with Kagami is improper, and therefore should be withdrawn.

## II. CONCLUSION

In consideration of the remarks set forth above, this paper is believed to be fully responsive to the Office Action dated January 9, 2007. The remarks in support of the rejected claims are believed to place this application in condition for allowance, which action is respectfully requested. In the event formal matters remain, the Examiner is invited to call the undersigned to discuss those matters before further action is taken.

Please charge any fees associated with this amendment to deposit account 07-0960.

Respectfully submitted,

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